



This document is scheduled to be published in the Federal Register on 07/29/2015 and available online at <http://federalregister.gov/a/2015-18602>, and on FDsys.gov

Billing Code 4310-55-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R9-ES-2009-0094]

[450 003 0115]

RIN 1018-AY64

Endangered and Threatened Wildlife and Plants; Listing the Honduran Emerald

Hummingbird (*Amazilia luciae*)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are listing the Honduran emerald hummingbird (*Amazilia luciae*) as endangered under the Endangered Species Act of 1973, as amended (Act). This species is endemic to Honduras, and the population is estimated to be between 5,000 and 10,000 breeding pairs. Its suitable habitat has decreased significantly in the past 100 years; habitat degradation, fragmentation, and loss have been identified as the primary threats to the continued survival of this species.

DATES: This final rule is effective [INSERT DATE 30 DAYS AFTER DATE OF FEDERAL REGISTER PUBLICATION].

FOR FURTHER INFORMATION CONTACT: Janine Van Norman, Chief, Branch of Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420, Arlington, VA 22203; telephone 703-358-2171. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

I. Purpose of the Regulatory Action

We are listing the Honduran emerald hummingbird as endangered under the Endangered Species Act (ESA or Act) (16 U.S.C. 1531 *et seq.*) as habitat degradation, fragmentation, and loss have been identified as primary threats to the continued survival of this species.

II. Major Provisions of the Regulatory Action

This action lists the Honduran emerald hummingbird as endangered on the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h).

Background

The ESA was passed to prevent extinction of species by providing measures to help alleviate the loss of species and their habitats. Before a plant or animal species can receive the protection provided by the ESA, it must first be added to one of the Federal Lists of Endangered and Threatened Wildlife and Plants. Section 4 of the ESA and its implementing regulations at part 424 of title 50 of the Code of Federal Regulations (CFR) set forth the procedures for adding species to these lists.

Previous Federal Actions

On June 23, 2010, we published a 90-day finding (75 FR 35746) on the petition announcing that we would initiate a status review to determine if listing this species is warranted. On January 2, 2013, we published a 12-month finding and proposed rule (78 FR 59) to list this species as endangered under the Act.

Summary of Comments

We base this final rule on a review of the best scientific and commercial information available, including all information we received during the public comment period. In the January 2, 2013, proposed rule (78 FR 59), we requested that all interested parties submit information that might contribute to development of a final rule. The public comment period was open for 60 days, ending March 4, 2013. We also contacted appropriate scientific experts and organizations, and invited them to comment on the proposed listing in accordance with our peer review policy, described in the section below. We received five (5) comments during the comment period including two from peer reviewers, one comment from the Petitioner, one comment containing three reports, and one non-substantial comment. These comments are available at <http://www.regulations.gov> in Docket No. FWS–R9–ES–2009–0094. The information in the comments provided updated life history information about the species, documented where this species has been recently observed, and provided an updated population estimate (5,000 – 10,000 breeding pairs). This information is described in the **Summary of Changes from Proposed Rule** section below as well as incorporated into the rule.

Peer Review

In accordance with our policy, “Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities,” that was published on July 1, 1994 (59 FR 34270), we sought the expert opinion of three appropriate independent specialists regarding this rule. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analysis. We sent copies of the proposed rule to the peer reviewers immediately following publication in the **Federal Register**. We invited these peer reviewers to comment, during the public comment period, on the specific assumptions and the data that were

the basis for our conclusions regarding the proposal to list this species as endangered under the Act. We received comments from two peer reviewers.

We reviewed all comments we received for substantive issues and new information regarding the proposed listing of this species; we address those comments in the section that follows. Comments that provided support or opposition without substantive information were noted, but not addressed in this final rule.

Summary of Changes from Proposed Rule

This final rule incorporates the comments we received on our proposed listing and newly available scientific and commercial information. Peer reviewers generally commented that the proposed rule was thorough and comprehensive. New reports relevant to the Honduran emerald hummingbird and its habitat were submitted during the comment period. Two resources were provided which provided new population estimates. The estimated number of Honduran emerald hummingbirds in one study (INGTELSIG 2013) was estimated to be larger than other estimates; however, there were several aspects of the methodology, assumptions, and study design that were questioned by other scientists to the extent that we did not have confidence in the population estimate provided in the study (Anderson et al. 2013, pp. 9-14). The second resource provided the most significant change; based on recent surveys, the population of this species appears to be greater than was previously believed. At the time our proposed rule published, the most current population estimate was 200-1,000 individuals; new information provided during the public comment period indicates that the population of the Honduran emerald hummingbird

is likely between 5,000 to 10,000 pairs (Anderson et al. 2013, p. 10). The new information is incorporated into this final listing determination. There are very few individuals studying and working closely with this species, and future studies are needed to obtain more precise estimates of the Honduran emerald hummingbird population. Our determinations were based on the best available scientific and commercial information. None of the information obtained during the comment period changed our final listing determination. A list of literature used in finalizing this determination and comments we received are available at <http://www.regulations.gov> under Docket No. FWS–R9–ES–2009–0094.

Species Information

Taxonomy

This hummingbird species was first taxonomically described by Lawrence in 1867, and placed in the Trochilidae family as *Amazilia luciae* (BLI 2013, p. 1; Sibley and Monroe 1993, 1990). Common names for the species include Honduran emerald hummingbird, Ariane De Lucy (French), and in Honduras it is commonly known as the colibrí esmeralda Hondureño (Spanish). BLI and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) both recognize the species as *Amazilia luciae* (BLI 2008, p. 1). We recognize this species as *Amazilia luciae*, which also follows the Integrated Taxonomic Information System (ITIS 2013). ITIS is a database maintained by a partnership of U.S., Canadian, and Mexican federal government agencies, other organizations, and taxonomic specialists to provide taxonomic information.

Description

The Honduran emerald hummingbird is one of more than 325 hummingbird species. Hummingbirds exhibit a wide range of flight-related morphology and behavior based on ecological factors (Altshuler and Dudley 2002, p. 2,325). As do all hummingbirds, the Honduran emerald hummingbird exhibits slight sexual dimorphism (physical differences between the females and males), which is demonstrated in the coloring of its plumage. This species is a medium-sized hummingbird with an average length of 9.5 centimeters (3.7 inches) (BLI 2008, p. 2). The male has an iridescent blue-green throat and upper chest and occasionally has a grey mottled coloring. Its back is an emerald green color, the ventral (underneath) side of the bird is pale grey with mottled green sides, and the tail is bright green with a bronze hint on the upper tail coverts (BLI 2008, p. 1). The plumage of the female is less brilliant (BLI 2008, p. 2). The tail of the female contains a grey tip, and the band of distinctive color on the throat of the female hummingbird is narrower, with pale edges (BLI 2008, p. 2; Monroe 1968, p. 183). Juveniles have grayish throats spotted with turquoise (BLI 2008, p. 2).

Hummingbird bills vary among species and are adapted for specialized feeding. The bill of the Honduran emerald hummingbird is black and slightly curved with a red mandible and dark tip and is slightly longer and more decurved (downward curving) bill than the closely related species *A. candida* (Monroe 1968, p. 182). The curvature of its bill is associated with foraging for nectar in plant species within its habitat (Gill 1987, p. 780).

Biology

The Honduran emerald hummingbird historically has preferred arid interior valleys of thorn forest and shrubs. The Aguán River Valley area rarely receives more than 76 centimeters (30 inches) of rain per year (Perez and Thorn 2012, pers. comm.; Gallardo 2010, <http://www.birdsofhonduras.com>). Due to the arid climate, many of the plant species are adapted to retain water and are succulents or contain spines as protection from herbivores. Many of the plants lose all their leaves in the dry season, and Honduran emerald hummingbird habitat may appear almost lifeless. Typical plants within its habitat include cacti, acacias, and other succulents. Three species of arborescent (tree-like) cacti have been associated with the Honduran emerald hummingbird's habitat: *Pilosocereus maxonii*, *Stenocereus yunckeri* (endemic), and *Opuntia hondurensis* (endemic) (House 2004, p. 15). The flowering of *Opuntia hondurensis* coincides with the nesting period of the Honduran emerald hummingbird (House 2004, p. 23). Large clusters of three species of orchids, *Myrmecophila wendlandii*, *Laelia rubescens*, and *Encyclia nematocaulon*, were found growing on cacti within the habitat (House 2004, p. 16). The trees and shrubs found in one study of its habitat were almost 100 percent deciduous (House 2004, p. 15). In larger, more mature trees, some bromeliads (when blooming are sources of nectar and energy) were found. Although epiphytes (plants that grow non-parasitically on another plant, such as a tree) are usually rare in this habitat type, some epiphytes are well adapted to the extremes of this environment.

In Honduras, this habitat occurs primarily along the Gulf of Fonseca, in the Agalta Valley in the Olancho Department, and in the Aguán Valley in the Yoro Department (for a map of the Honduran emerald populations, see our proposed rule, 78 FR 63). This species tends to be found in similar altitudes, although it has recently been observed at higher elevations (Germer 2013,

pp. 1-2). Most of the hummingbird's occurrences have been noted at elevations between 150 and 600 meters (492 and 1,968.5 feet (ft)) above sea level; however, other observations were recorded at 845 and 1,220 meters (2,772 and 4,003 ft) (Germer 2012; pp. 55-56; Sanchez et al. 2011, p. 69).

The Honduran emerald hummingbird nests in March and April, and its nest has been observed in a Guayabillo tree (*Eugenia lempana*) (Espinal and Marineros 2008, p. 1). Its nests are made of cobwebs, lichens, and mosses, and it usually lays two eggs which hatch in 2½ weeks (Germer 2011, p. 52).

Emerald hummingbirds are somewhat aggressive and territorial (Collar et al. 1992, p. 493; Howell and Webb 1989, p. 643), due to competition with other hummingbird species for resources. This species has been observed feeding at heights between 0.5 to 10 meters (2 to 32 ft) (Howell and Webb 1989, p. 643). Some aspects of this species' behavior remain unclear, such as how far individuals disperse, what habitats are important for dispersal, and how the populations are linked genetically (Perez and Thorn 2012 pers. comm.; Anderson et al. 2010, p. 7).

As with all hummingbird species, the Honduran emerald hummingbird relies on nectar-producing flowers for food and energy, and relies on insects and spiders as sources of protein (Germer 2012, p. 2; Collar et al. 1992, p. 494). Thorn et al. (2000, p. 23) observed that habitat with abundant flowers, red in particular, appeared to be a critical characteristic for suitable habitat. Additionally, suitable habitat requirements include similar ecological conditions such as

access to nectar and insects, rainfall, humidity and temperature. During one field study in Santa Barbara, Honduran emerald hummingbirds were observed hunting arthropods about 50 percent of their time (Stiles 1985).

Hummingbirds are known to “disperse” rather than “migrate” in the sense that they do not follow routine, standard, round-trip movements; they follow sources of food availability (Berthold et al. 2003, pp. 40-41). Hummingbirds are the most specialized nectar-feeding birds in the New World (Graham et al. 2009, p. 19,673). Hummingbirds quickly shift to the best available sources of nectar; their choice of habitat may change concurrent with loss of their preferred food sources (Gill 1987, p. 785; Montgomerie et al. 1984). When a hummingbird’s habitat does not provide its required resources, research indicates that they tend to abandon a territory and move to more productive areas (Feinsinger and Colwell 1978; Kodric-Brown and Brown 1978 in Justino et al. 2012, p. 194). Emerald hummingbirds are habitat generalists in the sense that they do not rely exclusively on a single species of plant for nourishment; rather, they utilize a wide variety of nectar-producing plants to meet their nutritional requirements (Graham et al. 2009, p. 19,675). *Helicteres guazumaefolia*, which produces nectar all year (as opposed to seasonally), was observed to be a preferred food source for the Honduran emerald hummingbird in Santa Barbara (Komar et al. 2013, pp. 25-26). This species has been observed actively foraging mid-morning, concurrent with the time during the day when nectar is most plentiful. For example, energy present in *Heliconia stilesii* flowers averaged 200 to 300 joules per flower in the early morning and 300 to 500 joules per flower by midmorning (Gill 1987, pp. 781-782).

Germer (2011) found that during the dry season, the Honduran emerald hummingbird can be found in gallery forests (forests that grow in corridors along wetlands or rivers, projecting into sparsely treed areas), or near bodies of water where humidity and abundance of small arthropods is greater. Its use of these areas is believed to reduce its metabolic cost and escape heat during the driest seasons (pp. 52-53). High variability between detections was observed, which could imply that the species is not evenly distributed across the available habitat (Germer 2011, pp. 52-53); it may move seasonally in search of food sources.

In Yoro, the Honduran emerald hummingbird uses the species *Pedilanthus camporum*, which produces flowers year-round, and *Nopalea hondurensis*, which flowers generally between February and April, 90 percent of the time observed. In the Coyoles area in the Aguán Valley, the thorn forest is primarily comprised of Mimosaceae (herbaceous and woody species), Cactaceae (cactus species), and Euphorbiaceae (herbs, shrubs, trees, and some succulent species) (Collar et al. 1992, p. 494). In western Honduras, 90 percent of foraging observations were on *Aphelandra scabra* and *Helicteres guazaumifolia*. A list of plant species utilized by Honduran emerald hummingbirds is available in our proposed rule, 78 FR 63.

Population

In our proposed rule (78 FR 59), we noted that several attempts have been made to estimate the population status of the Honduran emerald. In 2007, the total population was estimated to be between 200 and 1,000 individuals (Anderson *et al.* 2007, p. 1). At the time of the publication of our proposed rule, the best estimate suggested a population of approximately 200-1000 individuals (BLI 2012, unpaginated; Perez and Thorn pers. comm. 2012).

During the public comment period, we received additional information indicating that the total population estimate for Honduran emerald may be higher than previously believed. One study, published in 2013, suggested that the population of Honduran emerald hummingbirds was significantly larger, estimated to be between 50,000 and 106,000 individuals (INGTELSIG 2013). We find this to be an overestimate due to several erroneous assumptions in the study design and sampling methodology, which were described in Anderson et al. (2013, pp. 10-12). More recent studies and research suggests that there are between 5,000 and 10,000 breeding pairs spread across seven separate populations (Anderson et al. 2013, p. 2). **Table 1** provides the current population estimate for each of the populations based upon the best available scientific and commercial information submitted by researchers working with the species.

Table 1: Population estimates by valley (Anderson 2013, pp. 2, 14).

Honduran Department:	Location of Population:	Population Estimate:
Santa Barbara Department	Tenchoa Valley	2,500 – 5,000 breeding pairs
	Jicatuvo Valley	
	Quimistán Valley	
Yoro Department	Aguán Valley	1,000 - 2,000 breeding pairs
Olancho Department	Agalta Valley	1,000 - 2,000 breeding pairs
	Telica Valley	500 - 1,000 breeding pairs
	Guayape Valley (Valle de Olancho)	Extirpated

Historic Distribution

The Honduran emerald hummingbird is the only known endemic bird species in Honduras (Anderson and Devenish 2009, p. 258; Portillo 2007, p. 17; Thorn et al. 2000, p. 3; Collar et al. 1992, p. 493; Monroe 1968, p. 182). Based on specimen data, the species was originally known to occur in four departments (which are similar to “states” in the United

States): Cortés and Santa Barbara in the west and Yoro and Olancho in the northeast. The Honduran emerald hummingbird was likely a forest inhabitant and described as locally common (Howell 1989, p. 642). The locations and dates where this species has been documented are as follows:

- Catacamas, Olancho (1937 and 1991) (Howell and Webb 1992, pp. 46-47; Monroe 1968, p. 182).
- Cofradía, Cortes (1933) (Monroe 1968, p. 182).
- Coyoles, Yoro (1948 and 1950) (Monroe 1968, p. 182).
- El Boquerón, Olancho (recorded September 1937) (Monroe 1968, p. 182).
- Olanchito, Yoro (1988) (Howell and Webb 1989, pp. 642-643).
- Santa Bárbara, Santa Bárbara (1935) (Monroe 1968, p. 182).

Between 1950 and 1988 there were no recorded observations of the Honduran emerald hummingbird. In 1988, the species was described as common in Olanchito and Coyoles, which are located 16 km (9 miles) apart (BLI 2008, p. 2). In 1991, between 22 and 28 individuals were found in a patch of habitat measuring 500 by 50 meters ($1,640 \times 164$ ft) near Olanchito (Howell and Webb 1992, pp. 46-47). In 1996, the bird was found in the Agalta Valley on less than 1 km^2 (247 acres or .39 square miles (mi^2)) of suitable habitat (BLI 2008, p. 3).

Current Distribution

Prior to its 1988 rediscovery in Olanchito and Coyoles, it was thought that habitat loss

had restricted the Honduran emerald hummingbird to isolated patches of arid thorn-forest and scrub of the interior valleys of northern Honduras. Between 2007 and 2013, this species was documented in seven valleys in Honduras (Anderson et al. 2013, p. 2; Germer 2012, pp. 52-60; Anderson 2010, p. 4) (see Fig. 1). In the Tenco Valley (Santa Barbara), researchers found individuals in five habitat patches, each separated by at least 5 km (3 miles). These habitat fragments were between 5 and 60 hectares (ha) (12 and 148 acres) each. It is estimated that the population in the Santa Barbara Department is approximately 200 km (124 miles) west of the nearest known population in the Aguán Valley (Anderson 2010, p. 5). The Honduran emerald hummingbird density within the Santa Barbara Department has been estimated to be between 76 and 167 individuals per km² (29-64 mi²) (Sanchez et al. 2011, p. 5), but its density varies based on food availability. BLI reports that its range is 400 km² (154 mi²). However, local experts believe its actual extent of occurrence may be closer to 150 km² (58 mi²) (Perez and Thorn pers. comm. 2012). Observations of the Honduran emerald hummingbird have been recently reported in western Honduras in the Quimistán Valley (in the Río Chamelecón watershed) and Tenco Valley (Río Ulúa watershed), in the Santa Barbara Department where it had not been recorded since 1935. The westernmost occurrence of the species is in the Oro River Valley, near Sula in the municipality of Macuelizo. The northernmost site is in the Valley of Azacualpa, also in the municipality of Macuelizo.

Agalta Valley (Olancho Department)

In 2007, this species was observed in the Agalta Valley and in the Telica Valley, both in the Olancho Department (Anderson and Hyman 2007, p. 6). The Agalta Valley is described as a remote region in the mountains of eastern Honduras containing over 1,000,000 ha (2,471,054

acres) of land characterized as dry basin. Here, the Honduran emerald hummingbird's habitat primarily is on large, privately owned cattle ranches that have restricted access (Anderson et al. 2010, p. 3). The species has been known to occur in this valley since the mid-1990s (Anderson et al. 1998, p. 181). Although this species exists in the Agalta Valley, very little information regarding the factors affecting this species in this area are known. Reports indicate that areas that contain suitable habitat characteristics for the Honduran emerald hummingbird are being cleared for rice cultivation (Hyman 2012, pers. comm.; Bonta 2011, pers. comm.). Several of the remaining habitat patches are connected by narrow corridors of habitat along property lines and waterways, but most of the patches of remaining habitat are "islands" within cattle pasture, which comprises approximately 90 percent of the Valley's area (Bonta 2011, pers. comm.).

Aguán Valley (Yoro Department)

This hummingbird species is known in the Aguán Valley, Yoro Department, in the areas of Olanchito and Coyoles, and is reported as relatively common, but only within its remaining suitable habitat (Gallardo 2010, p. 186; Thorn et al. 2000, pp. 22-23). This species has also been observed in New Valle del Rio de Oro, Valle de Azacualpa, and Rio Jicatuyo in the vicinity of San Luis. The Honduran emerald hummingbird's habitat formerly encompassed a large extent of the Aguán Valley, a once pristine plain of nearly 4,662 km² (1,800 mi²). Ninety percent of its original habitat no longer exists in its original form due to the conversion of its habitat to banana plantations and cattle pasture. Much of the Honduran emerald hummingbird's habitat is on privately owned land and is often planted with nonnative grasses for cattle grazing (Perez and Thorn 2012, pers. comm.; Anderson pers. comm. 2008 in Petition 2008, p. 11). In some cases, it is planted with invasive grass species (http://www.birdlist.org/cam/honduras/hn_ecosystems.htm,

accessed May 22, 2012). Today, due to decades of unregulated and expanding cattle ranching, the hummingbird's dry forest range is limited to a few small, isolated islands of habitat. Its increasingly smaller ecosystems are surrounded by human-dominated landscapes. One estimate indicated that between 2,428 and 3,237 ha (6,000-8,000 acres) of suitable habitat remains in the Aguán Valley, most of which is privately owned (Gallardo 2010, p. 186); however, other estimates indicate that the species has even less suitable habitat available than the above estimate (Perez and Thorn 2012 pers. comm.).

The lands along the Aguán River have periodically been devastated by banana diseases, floods, and hurricanes, particularly Hurricane Fifi in 1974 and Hurricane Mitch in 1998 (NOAA 2012, p. 2; Winograd 2006; USGS 2002, p. 5). This valley is on the south side of the Nombre de Dios Mountain Range, primarily in the Yoro Department (Gallardo 2010, p. 185). The Aguán River Watershed is 10,546 km² (4,072 mi² or 2,605,973 acres), is delimited by the tributaries of the Aguán River, and extends across the departments of Yoro, Colon, Atlántida, and Olancho (WWF 2008, p. 12; see Map 5, Map of Honduras, Aguán Valley at <http://www.regulations.gov> under Docket No. FWS-R9-ES-2009-0094). This valley experiences a unique microclimate in which most of the rain falls between June and November (Gallardo 2010, p. 185). The land in the Aguán Valley is rich and fertile, and therefore, highly likely to be converted into agricultural lands fields, particularly in a country with a high poverty index that relies strongly on its land for agriculture (WWF 2008, p. 2).

Western Honduras

In 2000, a survey was conducted for the Honduran emerald hummingbird and concluded that it occurs in dry tropical forest (Anderson and Hyman 2007, pp. 1-4; Thorn et al. 2000, pp. 1-

5). Upon the recent rediscovery of the species in western Honduras, researchers determined that the species was also residing in areas with different ecological characteristics (Anderson et al. 2010). Sites occupied by the Honduran emerald hummingbird in western Honduras are best described as semi-deciduous woodland, a habitat that has not previously been associated with the species. Canopy height in this area averages 15 meters (49 ft), dominated by semi-deciduous broad-leaved tree species, principally *Eugenia oerstediana*, *Bursera simaruba*, and *Tabebuia rosea*, that form a relatively closed tree canopy. Common understory species are *Agave parvidentata*, *Tillandsia fasciculata*, *Bromelia pinguin*, *Bromelia plumieri*, and *Acanthocereus pentagonus* (Anderson 2010, p. 5). According to Komar et al. 2013, this species has been observed utilizing four habitats (dry forest, dry scrubland, wooded pasture, and lowland pine/oak forest).

Conservation Status

The Honduran emerald hummingbird is listed as endangered by the IUCN (2012). The category of this species was reclassified as endangered from critically endangered following its recent discovery in the western part of Honduras, which increased its known range (BLI 2012, pp. 1-2). Its IUCN classification is based on its very small and severely fragmented range and population. However, this status under IUCN conveys no actual protections to the species. The Honduran emerald hummingbird has been listed in Appendix II of CITES since October 22, 1987, at which time all hummingbird species not previously listed in the Appendices were listed in Appendix II. Honduras and the United States are both Parties to CITES, an international treaty among 180 nations through which member countries, called Parties, work together to ensure that international trade in CITES-listed animals and plants is not detrimental to the

survival of wild populations. This goal is achieved by regulating import, export, and re-export of CITES-listed animal and plant species and their parts and products through a permitting system (<http://www.cites.org>). Appendix II includes species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and other species which must be subject to regulation in order that trade in specimens of certain species threatened with extinction which are or may be affected by trade may be brought under effective control (CITES Article II(2)). International trade in specimens of Appendix II species may be authorized through a system of permits or certificates under certain circumstances, and must be in accordance with CITES Article IV. For example, export may only be authorized when: (1) The CITES Scientific Authority of the country of export has determined that the export will not be detrimental to the survival of the species; (2) the CITES Management Authority of the country of export has determined that the specimens to be exported were legally acquired; and (3) the CITES Management Authority of the country of export has determined that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment (CITES Article IV(2)). In the United States, CITES is implemented through the Act and implementing regulations at 50 CFR part 23.

Factors Affecting the Species

Introduction

The most serious threat affecting this species is the continued degradation and fragmentation of existing habitat, and the complete loss of habitat (estimated to be 90 percent)

over the past 100 years due to land conversion from prime thorn forest habitat to banana plantations, agriculture, and cattle pastures (Komar et al. 2013, p. 28; Perez and Thorn 2012, pers. comm.). Studies published in 2013 indicate that in Santa Barbara, the area that contains the most suitable habitat for the Honduran emerald hummingbird, agriculture, cattle grazing, coffee cultivation, mining, dam construction, and fires are the primary factors contributing to the degradation, fragmentation and loss of habitat (Komar et al. 2013, p. 37; Anderson et al. 2013, pp. 1-3). This loss of habitat interacts with the ecologically deleterious factors associated with palm oil production, land ownership, pesticides and fertilizers, roads, hydroelectric and development projects, international trade, disease and predation, small and declining populations, and other factors in affecting the Honduran emerald hummingbird's habitat. These factors are discussed in detail below.

Habitat Degradation and Fragmentation

Honduras has been steadily losing thorn forest cover, particularly since the early 1960s, mostly due to the conversion of thorn forest areas to agricultural areas, such as cattle pastures and coffee, bean, corn, and banana plantations (World Wildlife Fund 2008, p. 11; Anderson pers. comm. 2008 in Petition 2008, p. 11; Portillo 2007, p. 75). In Yoro, there are only four large patches of suitable habitat for this species remaining (Perez and Thorn 2012, pers. comm.; Anderson 2010). The four largest fragments are between 360 and 476 ha (890 and 1,176 acres), for a combined total of 1,704 ha (4,210 acres) (Anderson 2010, p. 6). In the Aguán Valley, as of 2000, suitable habitat for the Honduran emerald had reduced in size to an estimated 8,495 ha (20,991 acres) from 16,000 ha (39,537 acres) in 1977, and 30,000 ha (74,132 acres) in 1938 (Thorn et al. 2000, p. 25). Even with the rediscovery of the species in Santa Barbara and the

extension of its range in Olancho, the species' habitat has been reduced due to habitat conversion to plantations and cattle ranches (see Fig. 1; Perez and Thorn pers. comm. 2012). Due to habitat destruction/degradation rates in Santa Barbara, no suitable habitat for the Honduran emerald hummingbird may remain by the year 2025 (Anderson et al. 2013, p. 5).

In the last ~100 years, the Aguán region has experienced three periods of agricultural economic growth (WWF 2008, p. 11). Thorn forests were initially cleared in the Aguán Valley to create banana and plantain plantations and rice farms, as well as pasture for cattle (Stattersfield and Capper 2000, p. 311). However, after an outbreak of Panama disease occurred in bananas, the Aguán Valley was largely abandoned, and much of the land reverted to pasture or forest. As a result of the agricultural reforms of the 1960s and 1970s, Honduran campesinos (farmers) received farmland in the Aguán Valley and proceeded to clear and develop the Valley that was previously forested into an agricultural region. In the late 1970s, lands were again cultivated with disease-resistant varieties of bananas. In the Aguán Valley, 10,319 ha (25,500 ac) now consist of banana plantations in an area known as the Barisma farm (Dole 2011, p. 67). One of the best patches of optimal Honduran emerald hummingbird habitat in the Aguán Valley has practically disappeared due to its proximity to a nearby town (Thorn 2012, pers. comm.). Now, only a single forest remnant larger than 100 ha (247 ac) that is suitable for this species is known to exist in this valley (Anderson 2010, p. 6). Habitat suitable for Honduran emerald hummingbirds continues to be cleared by private landowners in order to plant pasture grass for grazing cattle (Hyman 2012 pers. comm.).

Several hummingbird species have persisted in fragmented tropical landscapes (Stouffer & Bierregaard 1995 in Hadley & Betts 2009, p. 207). However, hummingbird persistence at the landscape scale does not indicate that the population is at the same level it was prior to deforestation (Hadley & Betts 2009, p. 207). Flight paths used by the green hermit hummingbird (*Phaethornis guy*) indicate that gaps in suitable habitat alter hummingbird movement pathways (Hadley 2012, p. 48; Hadley & Betts 2009, p. 209). Due to the fragmentation of their habitat, Honduran emeralds and other hummingbird species are forced to expend more energy moving between suitable habitat patches to breed, feed, and nest; the flight of hummingbirds is one of the most energetically demanding forms of animal locomotion (Buermann et al. 2011, p. 1,671). In agricultural landscapes, hummingbirds were observed traveling longer distances and took more circuitous routes than in forested landscapes. Overall, movement paths were strongly linked to areas that contained higher forest cover (Hadley & Betts 2009, p. 209).

Nectar is the primary source of carbohydrates for hummingbirds, and insects or pollen is the primary sources of protein for hummingbirds (Araújo et al. 2011, p. 827; Hegland et al. 2009, p. 188). Although studies of nutritional requirements have been conducted with respect to other hummingbird species, the home range required to support the breeding, feeding, and nesting requirements for each pair of Honduran emerald hummingbirds is unknown. Hadley noted in 2012 that plant densities, flower abundance, and flower quality (e.g., number of inflorescences, display size) can all be affected by landscape configuration such as edge effects (changes in population or community structures occurring at the boundaries of two habitats) due to factors such as light and humidity levels; therefore, hummingbird foraging behavior is likely sensitive to fragmentation (Hadley 2012, pp. 23-35). Efforts by Pico Bonito National Park Foundation

(Fundación Parque Nacional Pico Bonito (FUPNAPIB)) and others have attempted to preserve important parts of this species' habitat; however, even the areas designated as protected are experiencing habitat degradation (Hyman 2013, pp. 1-2).

Land Ownership

Because approximately 84 percent of the Honduran emerald's suitable habitat is privately owned, it is difficult to provide protections to this species (Steiner 2012 pers. comm.; FAO 2010, p. 238). In many cases, the only sites in Honduras that have maintained a viable ecosystem in somewhat of a natural state are places with irregular topography. Subsequently, these areas have become protected or private nature reserves (Portillo 2007, p. 75). Much of this species' original habitat, thorn forest, has been cleared for housing, towns, agriculture, and cattle grazing (Stattersfield and Capper 2000, p. 311; Thorn et al. 2000, p. 4). This species' remaining habitat in the Aguán Valley (Yoro Department) and Agalta Valley (Olancho Department) is primarily privately owned as large *haciendas* (plantations or farms), where cattle grazing, clearing for cattle, and plantation agriculture continues to occur (Stattersfield and Capper 2000, p. 311). In the lower river valley, agricultural cooperatives are raising citrus fruits, corn (maize), rice, and African palm for oil (WWF 2008, p. 12). Because most of this species' habitat is unprotected, the species is likely to continue to experience habitat degradation through conversion of its habitat to other uses such as cattle grazing and agricultural plantations.

Palm Oil Production

Although palm oil plantations in the Aguán River Basin have not been directly implicated as the cause of Honduran emerald habitat loss, palm oil plantations have replaced pasture lands that were left behind after the banana plantations diminished from their initial success during the first part of the 20th century (WWF 2008, p. 30). The palm oil production in the Aguán River Basin is concentrated between Sava and Tumbaderos (WWF 2008, p. 17) and covers 28,082 ha (69,392 ac.). The area includes plantations, processing plants, nurseries, palm oil collecting sites, and other infrastructure. Honduras' palm oil industry exported over \$21 million U.S. dollars' worth of palm oil in 2004, and Honduras is expected to increase its production of palm oil for biofuel (Silvestri 2008, pp. ii-iii). Other countries are encouraging Honduras to increase production of palm oil, which would likely affect the Aguán River Basin (Silvestri 2008, pp. 47; WWF 2008, pp. 37-38). These changes in land use have had an environmental cost (WWF 2008, pp. 30, 53-54), such as land degradation through deforestation and exposure to fertilizers and pesticides, which are discussed below. Although the conversion to palm oil plantations may not be occurring directly in Honduran emerald hummingbird habitat, its effects may impact this species via the development of roads, habitat conversion, and settlements.

To provide perspective on the magnitude of the production in this valley, the Aguán Valley Palm Producers Association (APROVA) is a cooperative of 154 oil palm farmers (USDA 2012, pp. 1-3). In 2009, APROVA opened its first palm oil processing plant, which processes up to five tons of palm oil per day (USDA 2012, pp. 1-3); there are now five processing plants. As of 1938, within the Aguán Valley 30,000 ha (74,131 ac) were the arid, thorn forest preferred by the Honduran emerald (Tierra America 2012, pp. 1-2). By 1977, suitable habitat for the Honduran emerald hummingbird had been reduced to 16,000 ha (39,537 ac), and in 2000, only

8,495 ha (20,991 ac) remained. Of that area, only 3,900 ha (9,637 ac) can be considered preserved well enough to sustain significant populations of the Honduran emerald hummingbird (Mejía pers. comm. in Tierra America 2012).

Table 1. Land reduction in the Aguán Valley.

Aguán Valley	Year	Hectares	Acres
Tropical Dry Forest	1938	30,000	74,131
Tropical Dry Forest	1977	16,000	39,537
Tropical Dry Forest	2000	8,495	20,991

Source: Thorn et al. 2000.

Pesticides and Fertilizers

The World Wide Fund for Nature (WWF) notes that agricultural production yield level can only be increased with the use of agrochemicals such as fertilizer and pesticides, which in turn all have an environmental impact. Before palm oil tree canopies fully develop, sunlight is able to penetrate the ground resulting in aggressive weed growth and frequent weed control is needed. Mechanical weed mowers hauled by agricultural tractors are used to keep weeds at a manageable height in between rows. Before the canopy is fully developed, areas around young plants are kept free of competing weeds mostly by chemical herbicides and by manually removing them (WWF 2008, pp. 24-25). However, these plantations are approximately 161 km (100 miles) north of the Honduran emerald hummingbird's habitat, and are not known to directly affect this species (Hyman 2012, pers. comm.). Therefore, we do not find pesticides and fertilizers to be a threat to the continued existence of this species.

Roads

Honduras is ranked among the countries with the lowest development of road networks in Central America (Acevedo et al. 2008, p. 1). The agricultural sector is the most important of the Honduran economy (Acevedo et al. 2008, p. 1); however, this sector is limited by difficulties of transportation and access to many of the productive areas of the country due to poor road infrastructure (Quintero et al. 2007, pp. 15-18; Winograd 2006, pp. 1-5).

Existing roads have been negatively impacted by hurricanes, flooding, and neglect after the crash of the banana industry. The Aguán and Agalta valleys, which contain this species' preferred habitat, are some of the most productive agricultural areas of the country, and this change in land use has decreased the available suitable habitat for the Honduran emerald hummingbird (Acevedo et al. 2008, p. 1). These agricultural areas of the country are in the departments of Atlantida (Aguán Valley) and Olancho (Agalta and Guayape valleys) and include bananas, coffee, palm oil, corn, beans, edible vegetables, fruits, and other crops. The improvement and development of roads to transport agricultural products to economic hubs is being considered by the Government of Honduras, which may affect the Honduran emerald hummingbird's habitat.

Growth in this economic sector is impeded by the lack of access to the most productive agricultural areas of the country due to poor road infrastructure. The road improvement project (Central Road, Route no. 23) is funded by the World Bank through the "Second Reconstruction and Improvement Project Road" (World Bank 2013, pp. 1-3; World Bank 2011, pp. 1-3; Proceso

Digital 2010). The road improvement project will likely bring more traffic, which will increase land speculation and settlement of homes along the road, ultimately impacting surrounding Honduran emerald hummingbird habitat (Perez and Thorn 2012, pers. comm.; Steiner and Coto 2011, pp. 1-2). Roads through prime Honduran emerald hummingbird habitat, which is presently affected by cultivation of bananas and plantains, link the river valley to the ports at Tela, La Ceiba, Trujillo, and Puerto Cortés.

There are plans to pave the road between Olanchito (Yoro Department) and San Lorenzo (Valle Department (southcentral Honduras)), an approximately 57-km (35-mile) stretch that currently passes through the Aguán Valley, which will further impact this species' habitat (Hyman 2012; pers. comm.; World Bank 2011, pp. 1-3; Anderson pers. comm. 2008 in Petition 2008; Hyman 2007, p. 10). This project has been contingent on several factors, such as a loan from the World Bank and implementation of measures to mitigate the impact on the environment. A 2007 World Bank report indicated that during the project planning stage, the scope of the project changed so that the road segment passing through vital habitat for the Honduran emerald hummingbird was not implemented (Quintero 2007, pp. 14-16). In this report, the World Bank indicated that payments for an environmental services plan, if successfully implemented, could lead to the long-term protection of an additional 1,000–2,000 ha (2,474 – 4,942 acres) of Honduran emerald hummingbird habitat on private lands. This, in turn, would address environmental concerns associated with the proposed paving of the Olanchito-San Lorenzo road (Quintero et al. 2007, p. 15). The original plans for this project included a target completion date of December 2014 (World Bank 2013, pp. 1-2); however, the best available information indicates that the closing date of the loan has been extended to May 31, 2015 and

implementation progress on the proposed infrastructure was rated as moderately successful (World bank 2015, unpaginated; World Bank 2014, p. 1-6).

The Agalta Valley is traversed by a highway that has been proposed to be repaved (Inter-American Development Bank 2013, pp. 1-2; Hyman 2012, pers. comm). This region is an area with a high rate of poverty, and this highway is, in part, intended to improve the economic conditions in this region. This region contains approximately 50,000 human inhabitants. The highway will complete the second paved transit route between the Pacific and Atlantic oceans in Honduras. The road is being improved in order to provide a better link between Tegucigalpa and the Atlantic coast of Honduras and will better connect the Departments of Francisco Morazán, Olancho, and Colón. It is unclear how this highway will affect the remaining 5,000 ha (12,355 ac) of this species' habitat (Bonta 2011, pers. comm.) in this valley.

Hydroelectric and Development Projects

The construction of several development projects could possibly affect this species' habitat (Bonta 2012, pers. comm.) in the Agalta Valley and the Tenco Valley. At least two hydroelectric projects have become operational in recent years (Bonta 2012, pers. comm.). These projects could likely result in more infrastructure development in the Valley, which could also affect the Honduran emerald hummingbird's habitat. Additionally, several agricultural development projects may be underway in the Agalta Valley (Bonta 2012, pers. comm.). Bonta indicates that the following projects, which can be located at <http://www.hondurasopenforbusiness.com>, are likely to affect the Honduran emerald

hummingbird's habitat.

- AGR112: Production of Transgenic Certified Maize,
- AGR126: Cultivation of Piñón, *Jatropha curcas*, for biodiesel (5,000 ha in the Agalta Valley),
- AGR401: Cultivation of Piñón (5,000 ha in the Agalta Valley),
- AGR402: Cultivation of Piñón,
- FOR204: Teak (*Tectona grandis*) plantation: 20,000 ha in three valleys; estimate of 4,000 to 8,000 ha in the Agalta Valley.

Although highway construction, agricultural development, and resulting infrastructure is likely to occur in the Agalta Valley, it is unclear how these activities would negatively affect the Honduran emerald hummingbird in this valley. To mitigate the effects of development in this area, a Honduran emerald hummingbird conservation strategy paper for the Agalta Valley was funded by the Inter-American Development Bank (IADB) and partially developed by the American Bird Conservancy. In the area of influence of IADB project HO-L1003, the strategy paper identified 20 remaining fragments of suitable Honduran emerald hummingbird habitat; all but one of these fragments is located on private land. The paper recommended development of a payments-for-ecosystem-services scheme (PES scheme) as the most viable conservation option. This concept would compensate landowners for conserving or restoring Honduran emerald hummingbird habitat found on their land in the Agalta Valley; however, it is unclear whether this has been implemented (IADB 2013, pp. 1-2).

International Trade

Data obtained from the United Nations Environment Programme–World Conservation Monitoring Center (UNEP-WCMC) show that, since its listing in CITES Appendix II in 1987, only two Honduran emerald hummingbird specimens have been recorded in international trade, involving two carcasses of unknown origin from Germany to the United States in 1996 (UNEP–WCMC 2009b). Therefore, international trade is not a factor influencing the species’ status in the wild. We are not aware of any other information that indicates that collection or overutilization of the Honduran emerald hummingbird is affecting this species.

Disease and Predation

The Intergovernmental Panel on Climate Change (2014, p. 1530-1532) suggests that the distribution of some disease vectors may change as a result of climate change. However, after conducting a status review of the Honduran emerald hummingbird and consulting with experts, we have no information at this time to suggest that any specific diseases are or may become problematic to this species.

Small and Declining Population

In our proposed rule (78 FR 59), we found that the species' small population size (at the time of our proposal, estimated to be 200 – 1,000 individuals) combined with its highly restricted and severely fragmented range, increased the species' vulnerability to adverse natural events. The species' potential exposure to extreme weather events such as hurricanes, extended periods of drought, or flooding, in combination with habitat loss and degradation was believed to be affecting the continued existence of the species throughout its range.

During the public comment period, we received new information indicating that the population estimates were much higher than previously believed (5,000 – 10,000 breeding pairs) (see **Population Estimates**). Based upon this updated estimate, we have re-evaluated whether the populations are susceptible to the risks associated with small and declining populations as described in detail below.

Endemic to Honduras, Honduran emeralds hummingbirds have been found in seven populations. In the Santa Barbara Department (western Honduras), they have been found in three separate valleys, Tenchoa Valley, Jicatuyo/Ulua river valley, and the Quimistan Valley. Anderson et al. (2013, p. 14) estimates a combined population for these three valleys to be roughly 2,500-5,000 breeding pairs; however, the researcher notes that no comprehensive, peer-reviewed population estimate has been completed for this area and as such, there is no current information indicating how the populations are distributed between the three separate valleys. Anderson et al. (2010, p. 258) stated that during research in Tenchoa Valley alone, they found individuals in five habitat fragments, each fragment measuring between 5 to 60 hectares (ha), separated from each other by at least 5 km. A single individual was found in a 40 ha forest fragment in Quimistan Valley (Anderson et al. 2010, p. 258). In the Yoro Department, a single population exists in the Aguán Valley, a considerable distance from other known populations; Anderson et al. (2010, p. 259) estimates that the Santa Barbara populations are 200 km west of the population in the Aguán Valley. Anderson et al. (2013, p. 14) estimates a population of 1,000-2,000 breeding pairs within the Aguán Valley. In the Olancho Department, Honduran emeralds are found in three separate valleys, Agalta, Tilica, and Guayape. Anderson et al. (2013, p. 14) estimates a population of 1,000-2,000 breeding pairs within Agalta Valley. In Guayape, the species is believed to have been extirpated. In 2012 and 2013, researchers were unable to

detect a single individual within this valley. Connected to Guayape Valley through a habitat corridor, it is believed the remaining population in the Tilica Valley may have historically been a part of the now-extirpated population (Anderson et al 2013, p. 13). In Tilica, the population is estimated to be between 500-1,000 breeding pairs.

Despite the increased total population estimate of 5,000-10,000 breeding pairs, research suggests the individual populations are small, including one population that is presumably extirpated. Research illustrates that the populations are both geographically and genetically isolated from one another. According to Anderson et al (2013, p. 3), there has been no evidence to date of Honduran emeralds being found between any of the seven valleys, indicating that while there is the potential for gene flow between the populations, the probability is minimal.

Species endemic to a few, widely dispersed locations are inherently more vulnerable to extinction than widespread species because of the higher risks from genetic bottlenecks, random demographic fluctuations, climate change, and localized catastrophes such as hurricanes, landslides, and drought (Lande 1988, p. 1,455; Mangel and Tier 1994, p. 607; Pimm *et al.* 1988, p. 757). Small populations can be more affected by factors such as demographic stochasticity (variability in population growth rates arising from random differences among individuals in survival and reproduction within a season), local catastrophes, and inbreeding (Pimm et al. 1988, pp. 757, 773-775). Due primarily to the current rate of habitat fragmentation, degradation, and loss, each Honduran emerald population is considered to be declining within their individual locales. Hummingbirds' flight and hovering abilities require a large amount of energy; this necessitates the utilization of foraging techniques that maximize the amount of nectar (energy) at a minimum cost. The degradation, fragmentation, and loss of habitat cause the species to expend more energy and resources in search of its basic nutritional requirements (Justino et al. 2012, pp.

194-195; Hadley and Betts 2009, p. 207). Habitat degradation, fragmentation, and loss can separate populations to the point where individuals can no longer disperse and breed among habitat patches, causing a shift in the demographic characteristics of a population and a reduction in genetic fitness (Gilpin and Soulé 1986, p. 31). A small, declining population makes the species vulnerable to genetic stochasticity (random changes in the genetic composition of a population) due to inbreeding depression and genetic drift (random changes in gene frequency). This, in turn, compromises a species' ability to adapt genetically to changing environments (Frankham 1996, p. 1,507), reduces fitness, and increases extinction risk (Reed and Frankham 2003, pp. 233-234).

Although new population estimates have increased the worldwide population estimate from 200-1,000 individuals to 5,000 to 10,000 breeding pairs, the individual populations of Honduran emerald are small and declining. Additionally, the species range is restricted within Honduras and the individual populations are geographically and genetically isolated from one another. The Honduran emeralds small and declining populations combined with their highly restricted and severely fragmented range increase the species' vulnerability to adverse natural events and are affecting the continuing existence of the species throughout its range.

Extreme Weather Events

Small, declining populations can also be especially vulnerable to environmental disturbances such as flooding, drought, or hurricanes (O'Grady 2004, pp. 513–514). The Honduran emerald relies on arid, thorn forest habitat to provide nectar-producing plant species for energy and insects for protein in order to meet the biological requirements for breeding,

feeding, and nesting. In 2012, Honduras was determined to be one of the countries most affected by climate change due to its geographic location, which is in the direct path of many tropical storms and hurricanes (Harmeling 2012, pp. 5-6). Research and modeling have explored how changes in climate might affect areas such as Honduras (Gasner et al. 2010, p. 1,250; Winograd 2002, p. 11). The term “climate change” refers to a change in the mean, variability, or seasonality of climate variables over time periods of decades or hundreds of years (Intergovernmental Panel on Climate Change (IPCC) 2014b, p. 5). Forecasts of the rate and consequences of future climate change are based on the results of extensive modeling efforts conducted by scientists around the world (Solman 2011, p. 20; Laurance and Useche 2009, p. 1,432; Nuñez *et al.* 2008, p. 1; Margeno 2008, p. 1; Meehl *et al.* 2007, p. 753).

Climate change models, like all other scientific models, produce projections that have some uncertainty because of the assumptions used, the data available, and the specific model features. The science supporting climate model projections, as well as models assessing their impacts on species and habitats, will continue to be refined as more information becomes available. While projections from regional climate model simulations are informative, various methods to downscale projections to more localized areas in which the species lives are still imperfect and under development (Solman 2011, p. 20; Nuñez *et al.* 2008, p. 1; Marengo 2008, p. 1).

Honduras appears to have entered a more active period of hurricane activity (Pielke et al. 2003, p. 102). Studies of natural events in the last 100 years indicate that Honduras is highly vulnerable to an increase in frequency and intensity in the future not only hurricanes, but also

landslides, flooding, and drought (Şekercioğlu et al. 2011; Gasner et al. 2010, p. 1250; Winograd 2006, p. 1). Due to its location and the biophysical traits of the region, Honduras is likely to be affected every 3 to 4 years by climate-related events, such as drought-related fires, floods, and landslides (Winograd 2006, p. 1). Winograd notes that 50 percent of Honduras is at risk of landslides, 30 percent is at risk of severe droughts, and 25 percent is at risk of flooding, particularly agricultural areas.

Arid-zone species are assumed to be more resilient to high temperatures and low humidity (Şekercioğlu et al. 2012, p. 5). However, species such as the Honduran emerald hummingbird are exposed to very dry conditions and are likely dependent on seasonal rains, as well as seasonal and permanent waterholes and rivers (Schneider and Griesser 2009 in Şekercioğlu et al. 2011, p. 5). Even small temperature increases can greatly increase the amount of birds' evaporative water loss (Şekercioğlu et al. 2011, p. 5). Warmer weather due to climate change is expected to impact the ability of birds in arid regions to sustain their water balance; this species has been observed at higher elevations (Germer 2012); which may indicate a response to warmer temperatures.

Climate models are not always able to predict the possible effects of ecological interactions, adaptation, or how species, particularly pollinators, might disperse in response to climate change (Buermann et al. 2011, p. 1,671; Burkle and Alarcón 2011, p. 528; Pearson and Dawson 2003, p. 361). Honduras is clearly in the path of hurricanes (Winograd 2006, 2002; Pielke et al. 2003, pp. 101-103). While additional research is still needed to determine how changes in climate may affect species such as the Honduran emerald hummingbird, studies

indicate that Honduras is highly vulnerable to an increase in frequency and intensity in hurricanes, landslides, flooding, and drought (Şekercioğlu et al. 2011; Gasner et al. 2010, p. 1250; Hegland et al. 2009, p. 184; Winograd 2006, p. 1). As the Honduran emerald has a restricted range within Honduras, and the seven remaining populations are small and declining, we find that the Honduran emeralds potential exposure to extreme weather events, in combination with habitat loss and degradation, is affecting the continued existence of the species throughout its range.

Conservation Measures in Place

Several mechanisms are in place which are intended to provide protections to the Honduran emerald hummingbird. These protections include involvement by nongovernmental organizations (NGOs), wildlife protection laws, and a reserve designated to protect its habitat. These mechanisms are described below.

Laws and Regulatory Mechanisms

Honduras has made significant progress in conservation of its natural resources (Portillo 2007, p. 60; Vreugdenhil et al. 2002, pp. 6, 11, 20-25). In the past 30 years, protected areas have increased from fewer than 20 protected areas to approximately 600 areas with nationally protected status (Portillo 2007, p. 60). Between 1974 and 1987, meetings were held with regional authorities in order to promote the conservation of the natural and cultural heritage of Honduras (Portillo 2007, p. 60). In 2003, the First Mesoamerican Congress on Protected Areas was held in Managua, Nicaragua. In 2010, Honduras began an initiative to recover degraded

areas and denuded forests (ECOLEX 2012). However, in some cases, these protected areas have not been managed effectively, as described below (Portillo 2007, p. 63; Vreugdenhil et al. 2002, pp. 6, 11, 20-25). Although the government of Honduras has shown initiative in protecting the species, implementation and enforcement seem to be lacking. Additionally, development projects are still occurring, such as the hydroelectric projects in Santa Barbara. Privately owned land continues to be sold to land speculators and converted from Honduran emerald hummingbird habitat to other uses, such as agriculture or cattle pastures.

NGO Involvement and the Honduran Emerald Reserve

In Honduras, several NGOs, such as The Nature Conservancy (TNC) and the Honduran Biodiversity Research Coalition, are participating in the conservation and management of this species. One protected area, the Honduran Emerald Reserve (Reserve), was established by the Honduran Government in 2005, with support from TNC. TNC has provided both technical and financial support to the government and local community groups to complete a 10-year management plan for the Reserve. This Reserve was established in connection with funding from the World Bank to finish building the main highway linking the capital with Olanchito, Yoro, via Cedros Francisco Morazán (Steiner and Coto 2011, pp. 1-2) (refer to *Roads*, above). Some aspects of TNC's involvement have included marking the official reserve boundaries and providing training to partners in the management of reserves and protected areas.

In 2009, the National Conservation and Forestry Institute (ICF) began a management plan for the protected area specifically for the Honduran emerald. This was with the participation of nearby municipalities, Arenal Olanchito, the department of Yoro, SOPTRAVI

Honduras Armed Forces (HAF), the Ministry of Education through the Regional Environmental Education Center, CREATE, the Ministry of Tourism, and the Ministry of Environment and Natural Resources (Steiner and Coto 2011, pp. 1-2; Portillo 2007, p. 99). The Interagency Technical Committee for Monitoring and Honduran Emerald Hummingbird Habitat Management Area was formed. In 2010, the ICF, with financial support from TNC, finalized the management plan for the protected area (Resolution No. DE-MP-147-2010).

This reserve is located 34 km (21 miles) west of the city Olanchito in the Aguán Valley. The reserve encompasses 1,217 ha (3,007 ac) and spans elevations between 220 and 800 meters (722 and 2,625 ft). As of 2012, there were 651 ha (1,609 ac) of dry forest habitat remaining that is suitable for the Honduran emerald hummingbird (Perez and Thorn 2012, pers. comm.; Thorn et al. 2000 in Anderson 2010, p. 6). The Honduran Emerald Reserve is guarded by Honduran Air Force soldiers, who patrol the reserve and do not allow visitors into the protected area without prior permission (Hyman 2012 pers. comm.). However, cattle from neighboring land owners are frequently found grazing uncontrolled on the property within Honduran emerald habitat (Steiner 2011, p. 1; House 2004, p. 30). Despite conservation efforts, land owners around the protected area want to expand their properties and are cutting more suitable habitat in order to plant grass for cattle grazing (Hyman and Steiner 2012, pers. comm.). Because encroachment and livestock grazing continue to occur both around and in the protected area, and this species requires more suitable habitat than what exists in this protected area, this area is insufficient to provide adequate suitable habitat for this species.

Another entity working towards conservation of the Honduran emerald is the Honduran

Biodiversity Research Coalition, which is a group of scientists and conservationists established in 2011 that undertakes and promotes biodiversity research and conservation in Honduras. The American Bird Conservancy is another NGO working to protect this species. One of its current goals is to work towards the development of a payment for ecosystems services project in the Agalta Valley to restore and protect Honduran emerald hummingbird habitat.

In conclusion, Honduras is improving its management of its resources (Food and Agriculture Organization of the United Nations 2010). However, most of the habitat required by the Honduran emerald hummingbird is privately owned, and the thorn forests are being converted to other uses that are not suitable for this species. Despite the progress made in Honduras with respect to laws and regulatory mechanisms in place to protect the Honduran emerald hummingbird, the species continues to face habitat degradation and fragmentation.

Finding (Listing Determination)

A species is “endangered” for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range. A species is “threatened” for purposes of the Act if it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Thus, in the context of the Act, the Service interprets an “endangered species” to be one that is presently in danger of extinction. A “threatened species,” on the other hand, is not presently in danger of extinction, but is likely to become so in the foreseeable future. In other words, the primary statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened). The statute requires us to

determine whether any species is endangered or threatened as a result of any one or combination of the following five factors in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. In considering what factors might constitute threats to a species, we must look beyond the mere exposure of the species to the factor to evaluate whether the species may respond to the factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat and we attempt to determine how significant a threat it is. The threat is significant if it drives, or contributes to, the risk of extinction of the species such that the species may warrant listing as endangered or threatened as those terms are defined in the Act. Section 4(b)(1)(A) of the Act requires us to make this determination based solely on the best available scientific and commercial data available after conducting a review of the status of the species and taking into account any efforts being made by States or foreign governments to protect the species.

In assessing whether the Honduran emerald hummingbird meets the definition of an endangered species or a threatened species, we considered the five factors in section 4(a)(1) of the Act. We conducted a review of the status of this species and assessed whether the Honduran emerald hummingbird is endangered or threatened throughout all or a significant portion of its range. We also reviewed all information we received during the public comment period. We have assessed the best scientific and commercial information available regarding the past, present, and future threats affecting this species.

This species requires a constant source of energy, primarily in the form of nectar and insects. In order to meet its energy and nutritional requirements, this species needs access to intact, suitable habitat with a diversity of plant species that contain abundant energy sources throughout the year.

We find that habitat loss due to conversion to agricultural development and cattle pastures is the main factor affecting the Honduran emerald hummingbird throughout its range (Factor A) (Komar et al. 2013, p. 40; Anderson et al. 2013, pp. 1-15; Bonta 2012 pers. comm.; Perez and Thorn 2012 pers. comm.). Habitat degradation and loss continue to occur and affect the species throughout its range. Uncontrolled clearing of the Honduran emerald's dry forest habitat for pastures or plantation agriculture has restricted the species to a few small, isolated "islands" of suitable dry forest habitat surrounded by banana plantations or cattle ranches (Perez and Thorn 2012, pers. comm.). Its current occupied and suitable range has been greatly reduced and is severely fragmented. This hummingbird species is expending more energy in order to find food sources to meet its nutritional needs, and as its suitable habitat becomes more scarce and fragmented, these habitat islands are growing farther apart.

Historically, the Honduran emerald hummingbird existed in more continuous, connected habitat. Its suitable habitat has become increasingly limited, and it is not likely to expand in the future. This species' population is estimated to be between 5,000 and 10,000 breeding pairs distributed over seven valleys in Honduras. A lack of a sufficient number of individuals in a local area or a decline in their individual or collective fitness may cause a decline in the

population size, despite the presence of suitable habitat patches. In cases where populations are small, effects on the species are exacerbated. Any loss of potentially reproducing individuals could have a devastating effect on the ability of the population to increase.

A species may be affected by more than one factor, and these factors can act in combination. The most significant factor affecting the Honduran emerald hummingbird is the degradation, fragmentation, and loss of suitable habitat (Factor A). Fragmentation and isolation of populations can decrease the fitness and reproductive potential of the species, which exacerbate other threats. Changes in Honduras' climate are acting in combination with other factors to affect this species' habitat. Extreme weather events (an increase in the severity and frequency in hurricanes and increased periods of drought (Factor E)) are impacting this species' habitat.

The species' small population size (Factor E), combined with its restricted and severely fragmented range (factor A), increase the species' vulnerability to adverse natural events (Factor E) that destroy individuals and their habitat. The species' potential exposure to extreme weather events, such as hurricanes, extended periods of drought, or flooding, in combination with habitat degradation and fragmentation, is currently affecting the continued existence of the species throughout its range now and in the future.

In conclusion, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats affecting this species. We have identified multiple factors that have interrelated impacts on this species. These factors occur at a scale

sufficient to affect the status of the species now and in the future. The most significant threat is habitat degradation and fragmentation due to conversion from thorn forest to agriculture and cattle pastures. Both biotic and abiotic ecological interactions influence species' distributions (Jankowski et al. 2010, pp. 1877-1883; Dunn et al. 2009, pp. 3037-3041). This species requires an environment that contains particular temperature and humidity levels, nectar, and insects. As a species' status continues to decline, the species becomes increasingly vulnerable to other impacts. The species' small population size, its reproductive and life-history traits, combined with its highly restricted and severely fragmented range, increases this species' vulnerability to one or more stochastic (random or unpredictable) events, such as hurricanes, drought, or flooding. These factors, in combination, are believed to be affecting the continued existence of the species throughout its range now and in the future.

Based on our evaluation of the best available scientific and commercial information and given the significant loss, degradation, and fragmentation of suitable habitat, we have determined the species is in danger of extinction throughout all of its range and thus meets the definition of an endangered species. Because the species is in danger of extinction now, as opposed to likely to become an endangered species within the foreseeable future, the Honduran emerald hummingbird meets the definition of an endangered species rather than a threatened species. Therefore, we are listing the Honduran emerald hummingbird as endangered under the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the

Act include recognition, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and encourages and results in conservation actions by Federal and State governments, private agencies and interest groups, and individuals.

Section 7(a) of the Act, as amended, and as implemented by regulations at 50 CFR part 402, requires Federal agencies to evaluate their actions within the United States or on the high seas with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. However, given that the Honduran emerald hummingbird is not native to the United States, we are not designating critical habitat for this species under section 4 of the Act.

Section 8(a) of the Act authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered and threatened species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign endangered species and to provide assistance for such programs in the form of personnel and the training of personnel.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered and threatened wildlife. These prohibitions, at 50 CFR 17.21 and 17.31, in part, make it illegal for any person subject to the jurisdiction of the United States to “take” (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect,

or to attempt any of these) within the United States or upon the high seas; import or export; deliver, receive, carry, transport, or ship in interstate commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits for endangered species are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

National Environmental Policy Act (NEPA)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), need not be prepared in connection with regulations adopted under section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this rule is available on the Internet at *<http://www.regulations.gov>* or upon request from the Branch of Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service (see **FOR FURTHER INFORMATION CONTACT**).

Author

The primary author of this rule is the staff of the Branch of Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; 4201–4245, unless otherwise noted.

2. Amend § 17.11(h) by adding a new entry for “Hummingbird, Honduran emerald” in alphabetical order under BIRDS to the List of Endangered and Threatened Wildlife to read as follows:

§17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
***** BIRDS *****							
Hummingbird, Honduran emerald	<i>Amazilia luciae</i>	Honduras	Entire	E	805	NA	NA

* * * * *

Dated: July 15, 2015.

James Kurth

Acting Deputy Director, U.S. Fish and Wildlife Service

[FR Doc. 2015-18602 Filed: 7/28/2015 08:45 am; Publication Date: 7/29/2015]